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**Huettner**

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(54) **MULTI-LAYER RADIAL POWER  
DIVIDER/COMBINER**

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patent is extended or adjusted under 35  
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333/134

(58) **Field of Classification Search** ..... 333/100,  
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See application file for complete search history.

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(57) **ABSTRACT**

An N-way multi-layer radial power combiner/divider com-  
prises an RF layer including N planar RF transmission lines  
radiating from a common port to N ports. An isolation layer  
substantially parallel to the RF layer comprises a star resistor  
having N resistive arms radiating from a common junction  
and N planar isolation transmission lines coupled in series to  
respective resistive arms. Each series pair of a resistive arm  
and an isolation transmission line is ideally a half-wavelength  
in electrical length. N vertical interconnects between the RF  
layer and the isolation layer connect the ends of the N isola-  
tion transmission lines to the ends of the N RF transmission  
lines at the N individual ports, respectively. Any path from  
one individual port through the common junction of the star  
resistor to another individual port is approximately a full  
wavelength  $\lambda_c$  or multiple thereof so that the phase angle  
through the isolation network is approximately zero degrees.  
This approach can achieve better isolation and power hand-  
ling than the Wilkinson design while employing the benefits  
of planar metallization technology.

**21 Claims, 12 Drawing Sheets**

